Net Mending

Winter Care Keeps Fisheries Tools in Shape for Summer Work

Story and Photos by Craig Bihrle

Photo Omitted.

Technology is changing the ways biologists discover information about fish.

Surgically implanted transmitters in a fish's belly allow detailed tracking of daily movements, compared to numbered tags that only plot the fish's location each time it is caught.

Tiny pieces of wire stamped with a numeric code are embedded in the snout of North Dakota salmon. When the salmon are caught years down the road, a biologist can read the barcode with a microscope.

Sophisticated sonar devices can identify schools or individual fish, and even estimate fish size.

North Dakota Game and Fish Department biologists have put these new capabilities to work over the last decade or so, compiling loads of information that would not have been possible previously unless a researcher would have donned scuba gear and followed fish around underwater for hours, days or weeks.

But technology hasn't changed everything. The mainstay of fisheries management is still sampling with nets, including the venerable frame or hoop net.

Not only have nets remained the foundation of fisheries research and management in North Dakota for decades, some of the same nets dunked in the backwaters to find out what kind of fish were around when lakes Sakakawea and Oahe were rising for the first time, are still in use today.

A lot of that has to do with early fisheries workers who decades ago learned the art of net repair at a time when funds were tight and it was either fix the net or do without. That hasn't really changed either, and that's why each winter, in the shops at Game and Fish Department district offices, you'll find a stack or two of nets waiting for annual inspection and maintenance so they're ready for another year of underwater employment.

Net Notes

Fisheries biologists primarily use two types of nets for research and management – frame nets and gill nets. Frame nets are made of woven fabric and consist of a long lead that directs fish into a compartment where they are confined until biologists come along in boats and pull the net up and take the fish out.

These types of nets are used for spawning operations, trapping and transplanting work, catching fish that are tagged for research projects, adult fish population sampling on

lakes and reservoirs, and fall netting to determine annual fish reproduction success on certain waters.

Gill nets are used in instances where frame nets will not work effectively. They are made of monofilament similar to heavy fishing line, are hard to fix, and don't last nearly as long as frame nets.

Frame nets come in different sizes, based on the opening to the compartment. Some are 3 feet by 4 feet, some are 4 by 6 feet, and some are 6 by 8 feet. At the Riverdale district office alone, the Department maintains about 60 nets. Add in offices in Dickinson, Williston, Jamestown and Devils Lake, the agency has around 200 nets to maintain.

If a net is not in good working order, it compromises whatever effort the Game and Fish Department is working on. If fish

Above: Russ Kinzler meticulously weaves a patch into a fisheries net. Getting the Game and Fish Department's fleet of nets in shape for a spring and summer of wear and tear is a high priority for fisheries workers during winter. Below: Each Game and Fish District office has a stack of two nets that might require repair in the off season.

escape after they swim into the holding compartments, it might mean fewer females from which to take eggs, or inconsistent survey data. "It doesn't do your sampling any good if you've got numbers that are off because you've got fish that are getting out or escaping," says Russ Kinzler, fisheries technician at the Department's Riverdale office, who devotes a good share of his winter workload to getting all of the district's nets ready to roll as soon as the ice goes out.

It's a big job that takes place in every district office shop each winter, but it comes at an opportune time when other fisheries work isn't as hectic as it is in spring, summer and fall. "Usually, by the time we get done with this," Kinzler said while sewing a patch onto a net that, upon closer inspection, had been in the shop before, "…by that time we're starting to get ready for spring again."

For most net menders, the fresh air of spring and working with fish trapped in still-icy waters is a welcome change after several weeks of sitting and sewing. It's not like

When positioned in the water, the frame net (below) has a long lead, sort of like a mesh wall, that blocks a fish's path. The fish then swim along the lead, usually away from shore, until they encounter the entrance to the holding compartment. Once in the trap, fish seldom get out until released by a fisheries worker (right). In this photo the situation called for the trap to be set near a culvert entrance and the lead to run away from shore, but typically the lead is anchored on or near shore and the trap is submerged in deeper water.
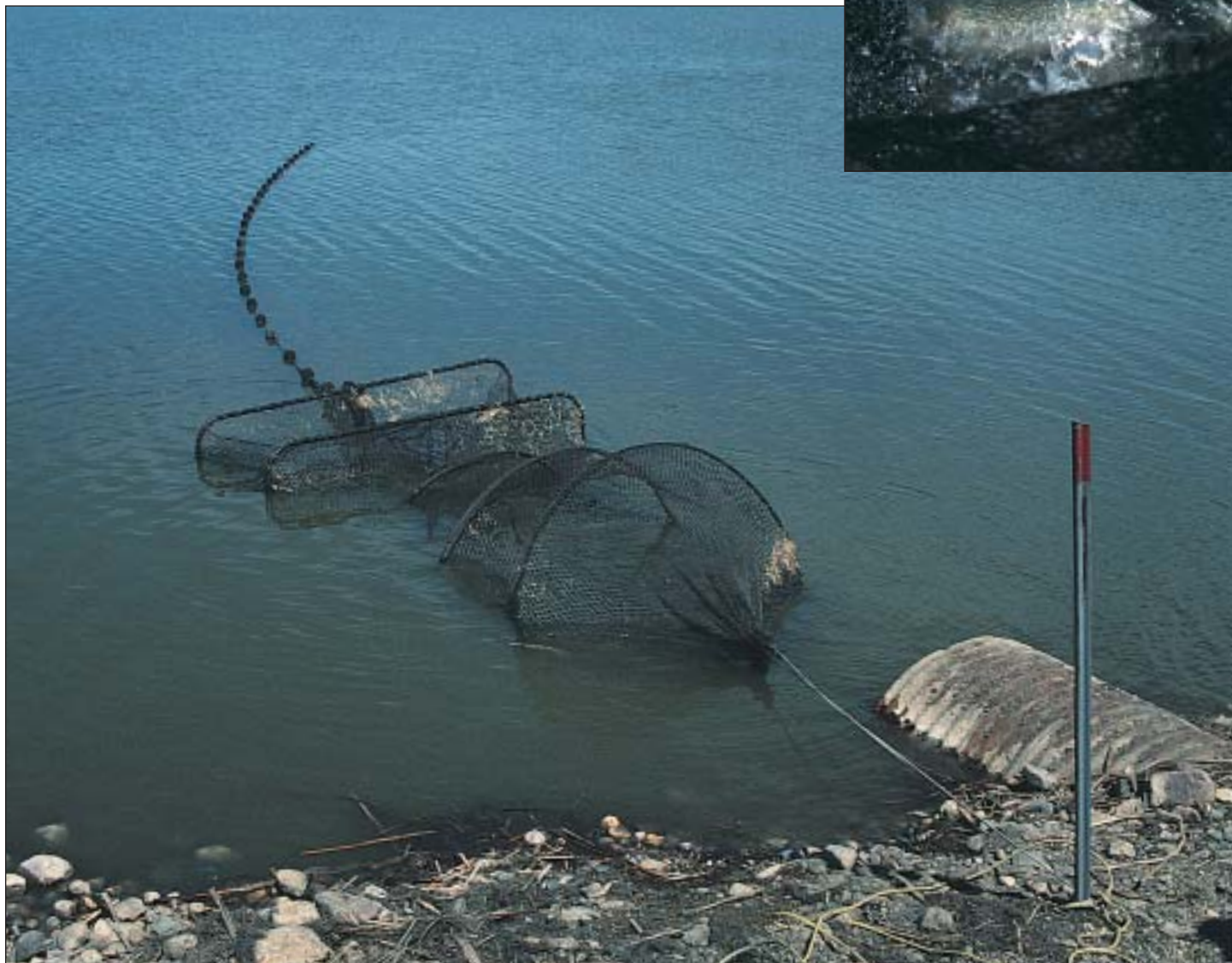
ironing on a patch to cover a hole in a pair of jeans. The material used for patching has the same size mesh as the net, Kinzler said. Each patch is cut to the same dimension as the hole, and when sewn in each knot must match up precisely.

It's intricate work, and time-consuming because it's all done by hand. It's a skill that's not taught in college fisheries biology coursework, but has been passed on by mentors who learned by trial and error.

Once all nets are patched, they are treated with a solution of tar and mineral spirits that makes the fabric water-resistant. Some nets are in the water for up to a month straight. Without treatment, material strength would deteriorate over time.

Oddly enough, Kinzler says, the biggest threat to fisheries nets isn't rolling wave action, sharp sticks floating by, or large fish muscling their way through the mesh. "Muskrats are the worst," he said. "They get in there and chew their way out."

Consistency is important, especially when the nets are being used for adult fish population sampling. Kinzler says the nets of each size are built to the same standards so that variability is minimized in survey results.

For instance, when biologists survey a lake to assess the adult fish population, they place nets in roughly the same location each time they do the survey. Time of year is also similar. Nets are checked each day and the number, size and variety of each fish caught is recorded.

When the survey period is over, numbers are calculated and final results are compared to those accumulated in previous years. By analyzing this data, biologists can tell if a lake's fish population is stable or going up or down, and if fish growth and size is adequate. When sudden decreases in number of fish or average size is noted, fisheries managers can try to correct the factor(s) causing the downward trend.

If a net has a hole in it so fish can escape before they are counted, measured and released, the final tally won't have the needed accuracy.

At the end of each field season, many nets have spent hundreds of hours under water. The total for all Department nets is about 50,000 hours for the open water season. They are all inspected, but they don't all need fixing. It takes a couple of hours on average to patch those that do need repair, but since a new net generally costs more than $700, "It's a lot cheaper to repair them than to just buy a new one each year," Kinzler said.

If treated properly, nets will last a long time. Many have patches sewn on patches. "This net's probably older than I am," the 34-year-old Kinzler joked as he worked on a six-inch hole one day last February, maintaining a research tool that is decidedly not high-tech, but highly effective just the same.

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The white patches indicate Russ Kinzler's handiwork. When the nets are treated to make the fabric more water resistant, the white turns to black and it's hard to tell the patch from the original.